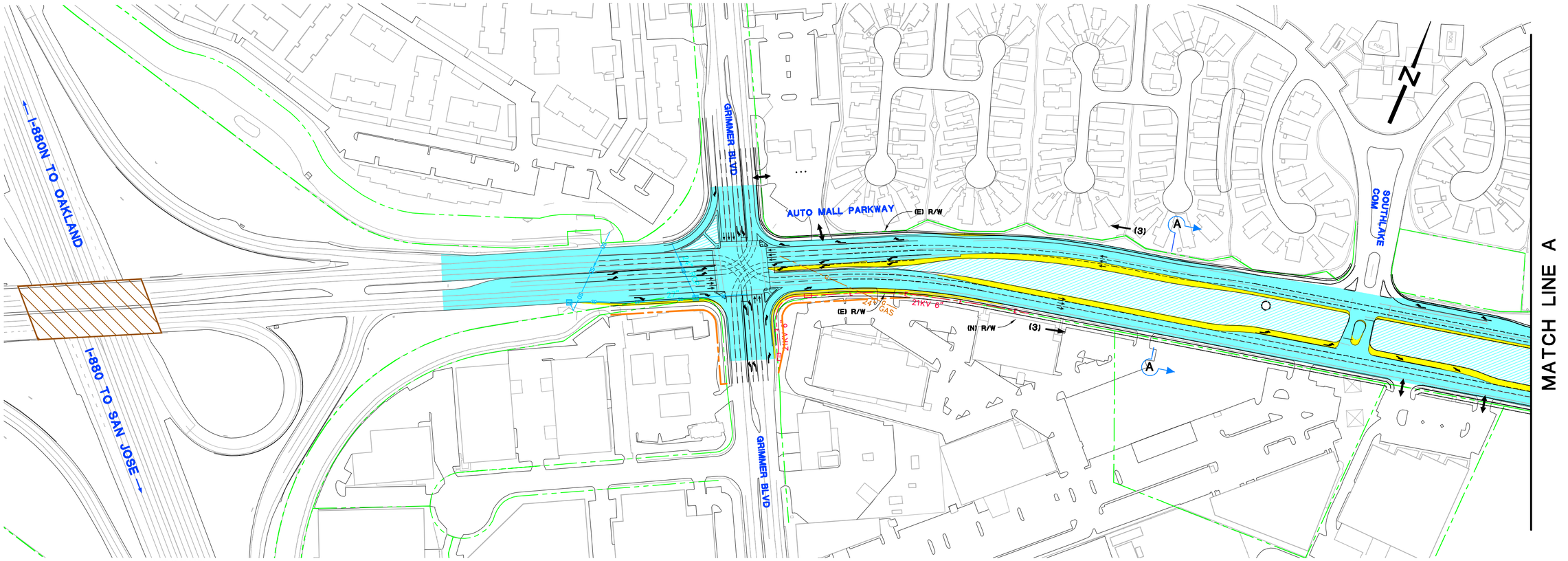
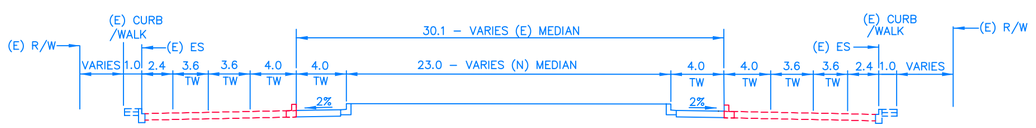


LEGEND

- (E) PAVEMENT
- ISLAND
- (E) STRUCTURE
- (N) PAVEMENT
- WIDEN (E) STRUCTURE
- (N) RIGHT OF WAY
- (E) RIGHT OF WAY
- (N) RETAINING WALL
- DRIVEWAY
- BUILDING IMPACT LIKELY
- ELECTRICAL TOWER
- ELECTRICAL
- GAS
- SEWER
- STORM DRAIN
- WATER



SECTION A-A
N.T.S.

Corridor A - Auto Mall Parkway
Widening to 6 Lanes - Grimmer Blvd. To Osgood Road - A1(a)

GRAPHIC SCALE
(IN METERS)
0 10 20 40 60 80 100
1 : 2000

Corridor A
Auto Mall Parkway
A1(a)

SHEET 1 OF 3

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SJ31 N:\a10737\cadd-metric\Auto Mall\Widening\ A-ALT.22-G2P1-COLORHLDWG 07/30/04 8:13 a.m.
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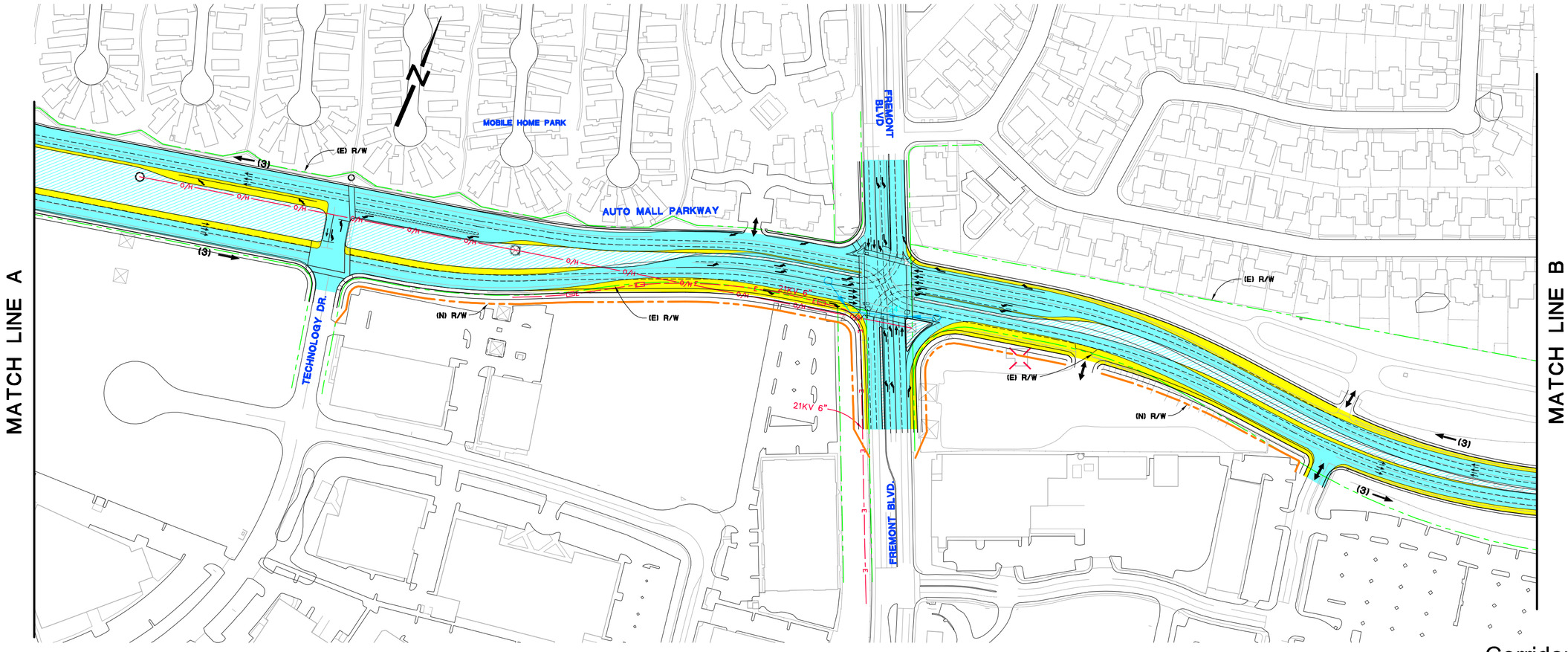

Corridor A
Auto Mall Parkway
A1(a)
SHEET 2 OF 3

Corridor A - Auto Mall Parkway
Widening to 6 Lanes - Grimmer Blvd. To Osgood Road - A1(a)

GRAPHIC SCALE
(IN METERS)
0 10 20 40 60 80 100
1 : 2000

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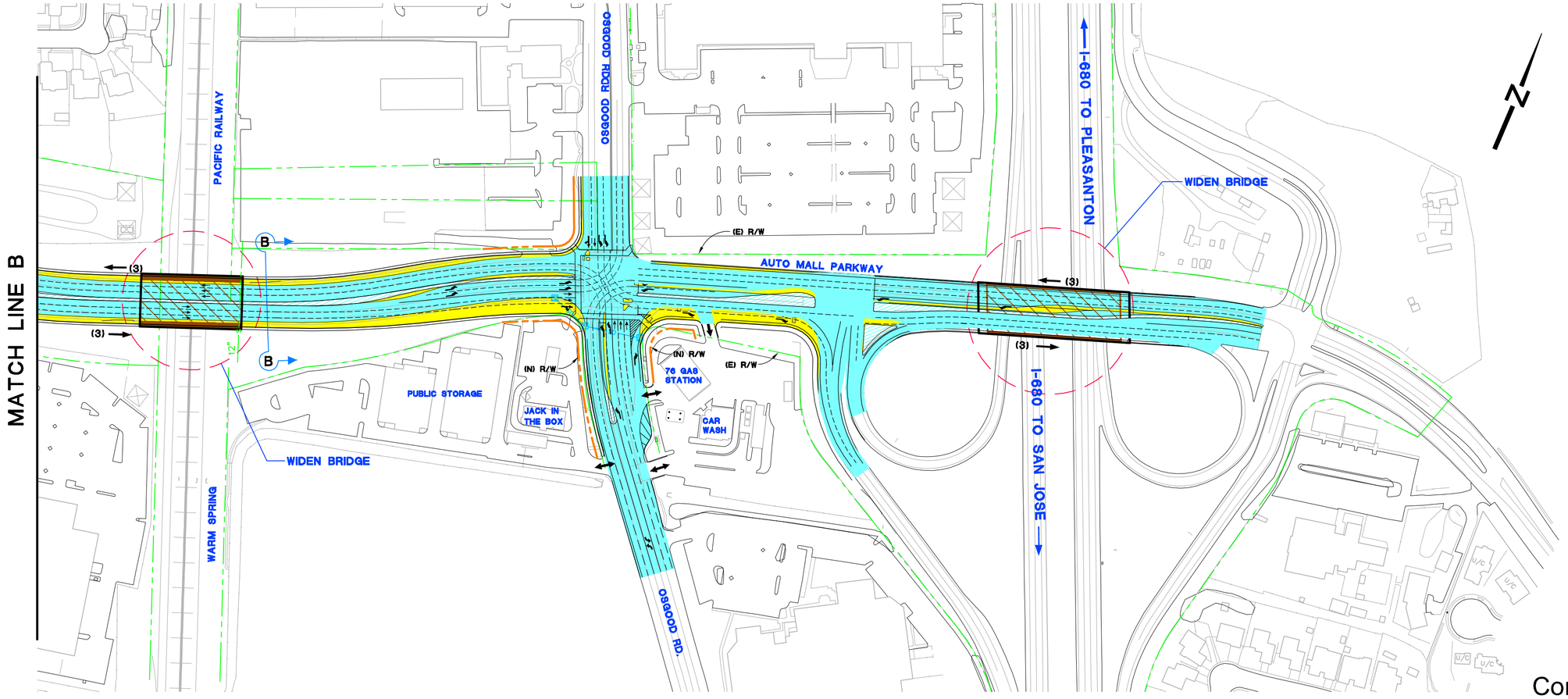

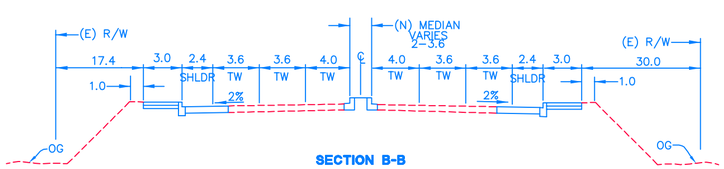

Corridor A - Auto Mall Parkway
Widening to 6 Lanes - Grimmer Blvd. To Osgood Road - A1(a)

GRAPHIC SCALE
(IN METERS)
0 10 20 40 60 80 100
1 : 2000

Corridor A
Auto Mall Parkway
A1(a)
SHEET 3 OF 3

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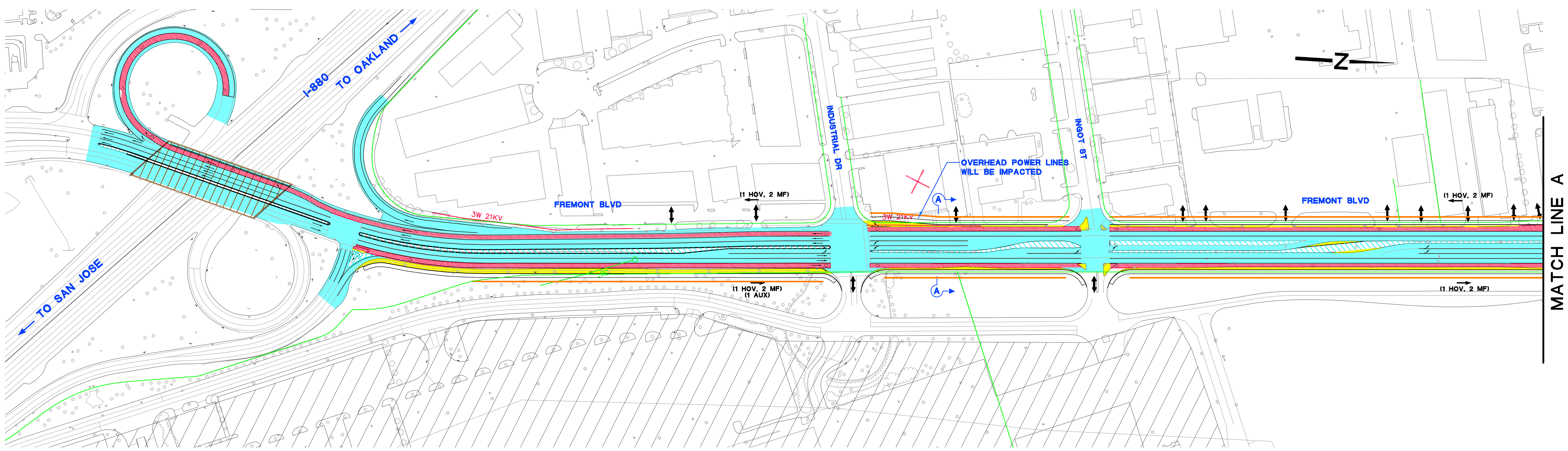

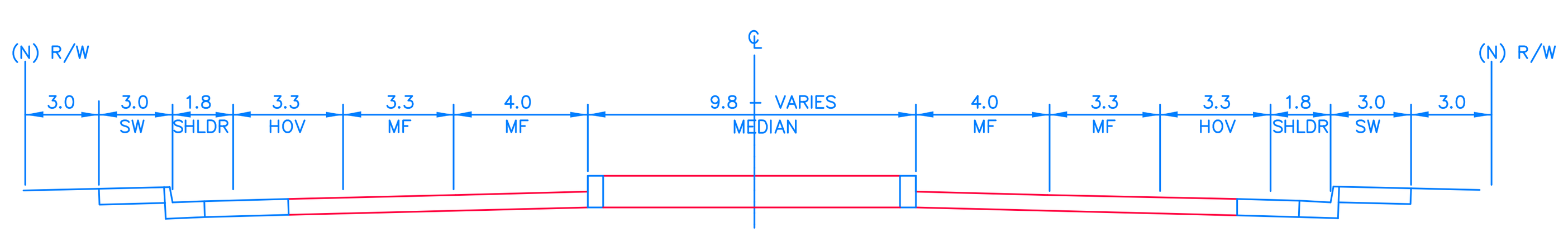

SECTION A-A (PROPOSED)
N.T.S.

LEGEND

(E) PAVEMENT	(N) RIGHT OF WAY
ISLAND	(E) RIGHT OF WAY
(E) STRUCTURE	(N) RETAINING WALL
(N) PAVEMENT	DRIVEWAY
(N) HOV LANE	BUILDING IMPACT LIKELY
(N) HOV RAMP	ELECTRICAL TOWER
WIDEN (E) STRUCTURE	ELECTRICAL
DEMOLISH (E) STRUCTURE	GAS
	SEWER
	STORM DRAIN
	WATER

Corridor B - Fremont Blvd./Grimmer Blvd.
At Grade HOV Access Between I-680 & I-880 - B1(b)

GRAPHIC SCALE
(IN METERS)
0 10 20 40 60 80 100
1 : 2000

Corridor B
Fremont/Grimmer
B1(b)
SHEET 1 OF 4

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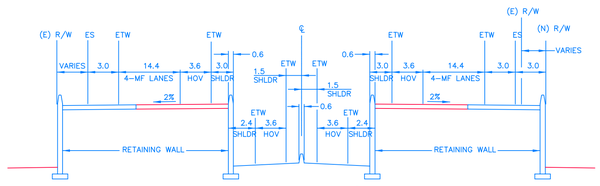
F-exto, A-Exto, Mi-exto, F-exma
SJS1 N:\sj0737\cadd-metric\Fremont Blvd\Widening\ F-ALT76-G1B-COLOR-HALF.DWG 07/30/04 9:38 a.m.



Corridor B
Fremont/Grimmer
B1(b)
SHEET 3 OF 4

Corridor B - Fremont Blvd./Grimmer Blvd.
At Grade HOV Access Between I-680 & I-880 - B1(b)

GRAPHIC SCALE
(IN METERS)
0 10 20 40 60 80 100
1 : 2000

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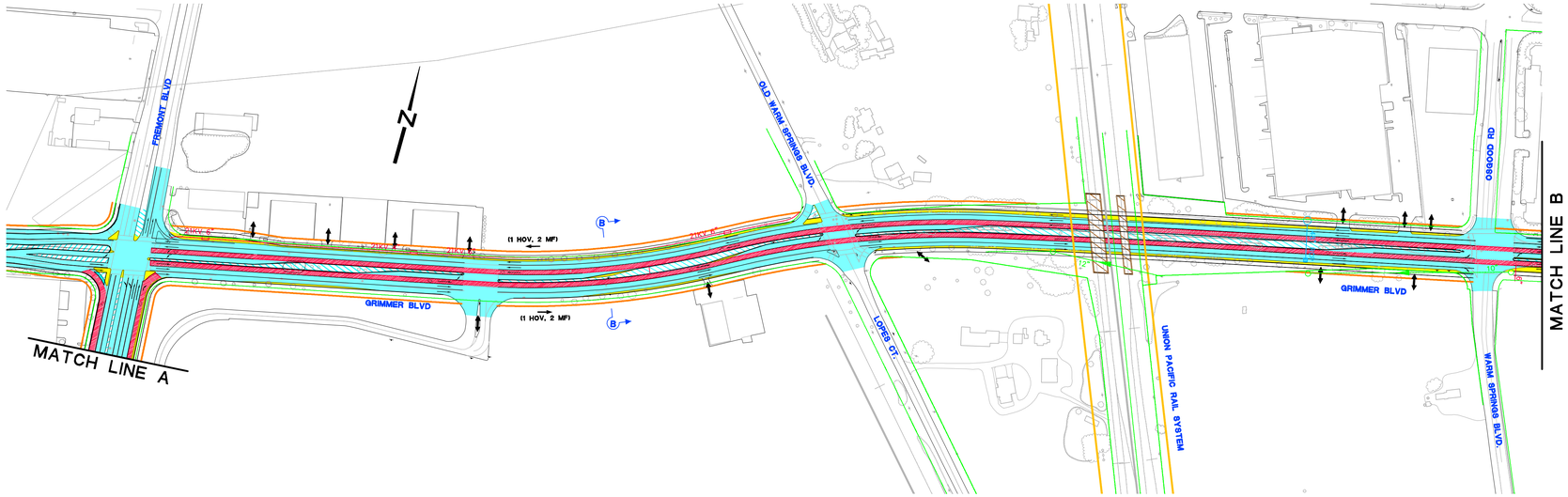

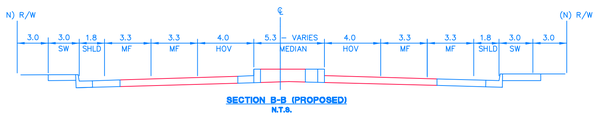

SECTION B-B (PROPOSED)
N.T.S.

Corridor B - Fremont Blvd./Grimmer Blvd.
At Grade HOV Access Between I-680 & I-880 - B1(b)

GRAPHIC SCALE
(IN METERS)
0 10 20 40 60 80 100
1 : 2000

Corridor B
Fremont/Grimmer
B1(b)
SHEET 2 OF 4

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MATCH LINE C

N

I-680

TO PLEASANTON

AUTO MALL PKWY

Corridor B
Fremont/Grimmer
B1(b)

SHEET 4 OF 4

Corridor B - Fremont Blvd./Grimmer Blvd.
At Grade HOV Access Between I-680 & I-880 - B1(b)

GRAPHIC SCALE
(IN METERS)

0 10 20 40 60 80 100

1 : 2000

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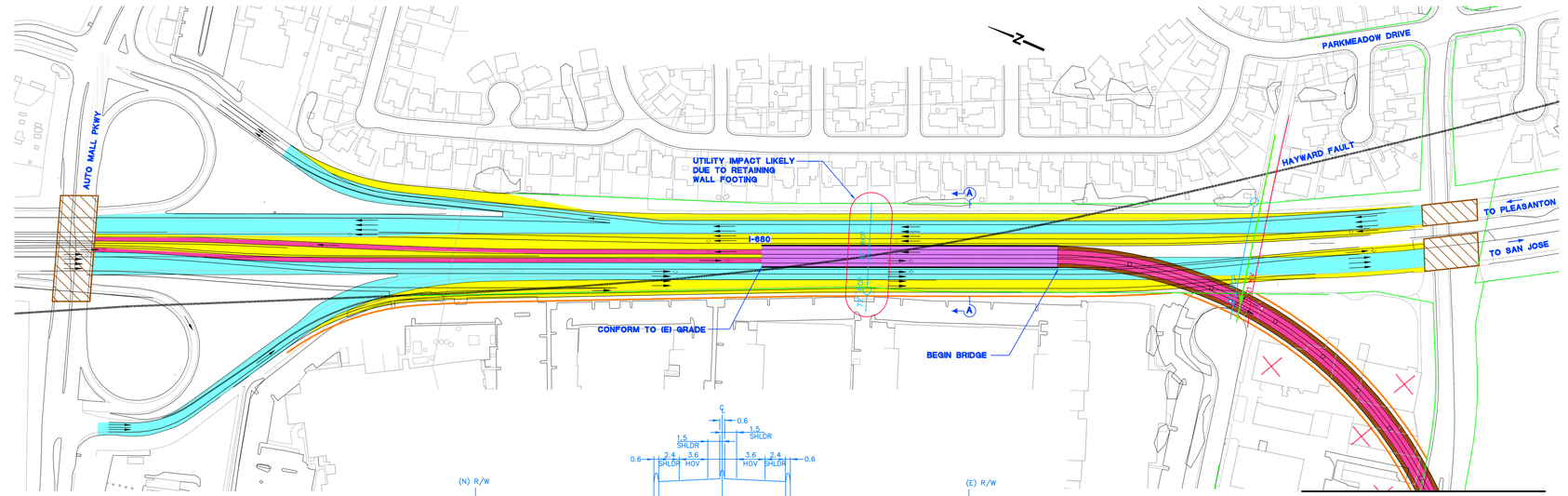

LEGEND

- (E) PAVEMENT
- ISLAND
- (E) STRUCTURE
- (N) PAVEMENT
- (N) HOV LANE
- (N) HOV RAMP
- (N) STRUCTURE
- DEMOLISH (E) STRUCTURE
- (N) RIGHT OF WAY
- (E) RIGHT OF WAY
- (N) RETAINING WALL
- DRIVEWAY
- BUILDING IMPACT LIKELY
- ELECTRICAL TOWER
- ELECTRICAL
- GAS
- SEWER
- STORM DRAIN
- WATER

Corridor B - Fremont Blvd./Grimmer Blvd.
Parallel/Aerial connection
Two Lane HOV Freeway Between I-680 & I-880 - B2(d)

GRAPHIC SCALE (IN METERS)
0 10 20 40 60 80 100
1 : 2000

Corridor B
Fremont/Grimmer
B2(d)
SHEET 1 OF 4

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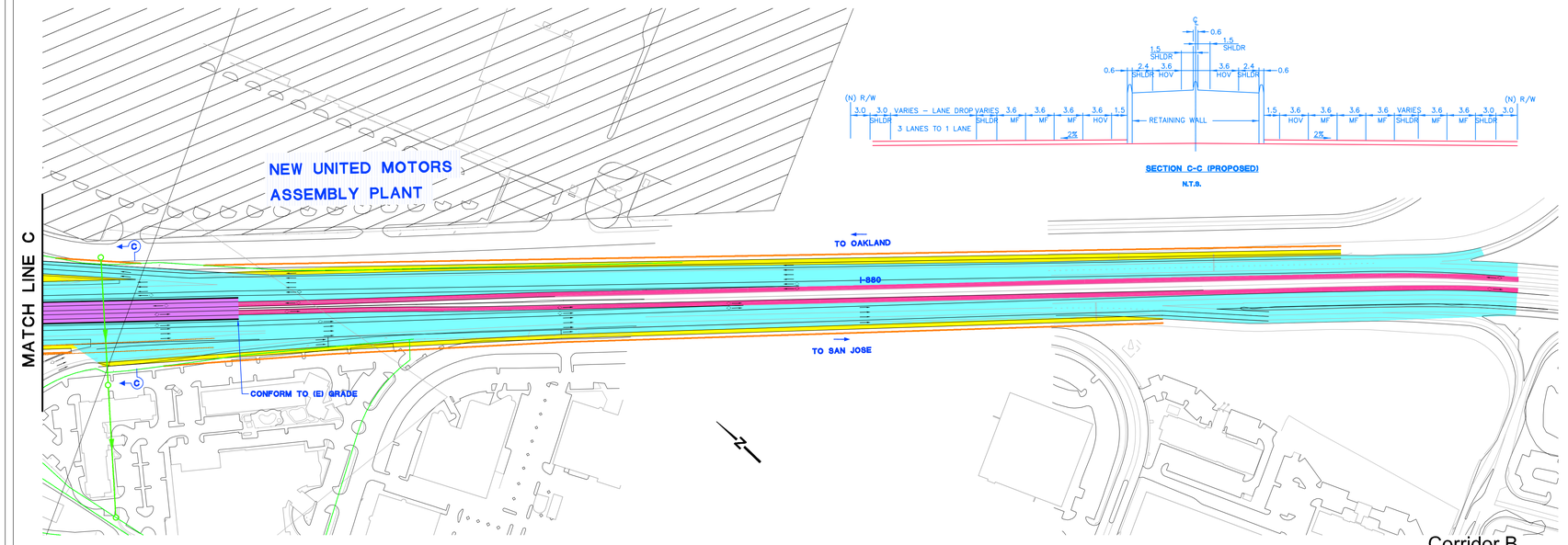

SECTION C-C (PROPOSED)

N.T.S.

Corridor B
Fremont/Grimmer
B2(d)

SHEET 4 OF 4

Corridor B - Fremont Blvd./Grimmer Blvd.
Parallel/Aerial connection
Two Lane HOV Freeway Between I-680 & I-880 - B2(d)

GRAPHIC SCALE
(IN METERS)
0 10 20 40 60 80 100
1 : 2000

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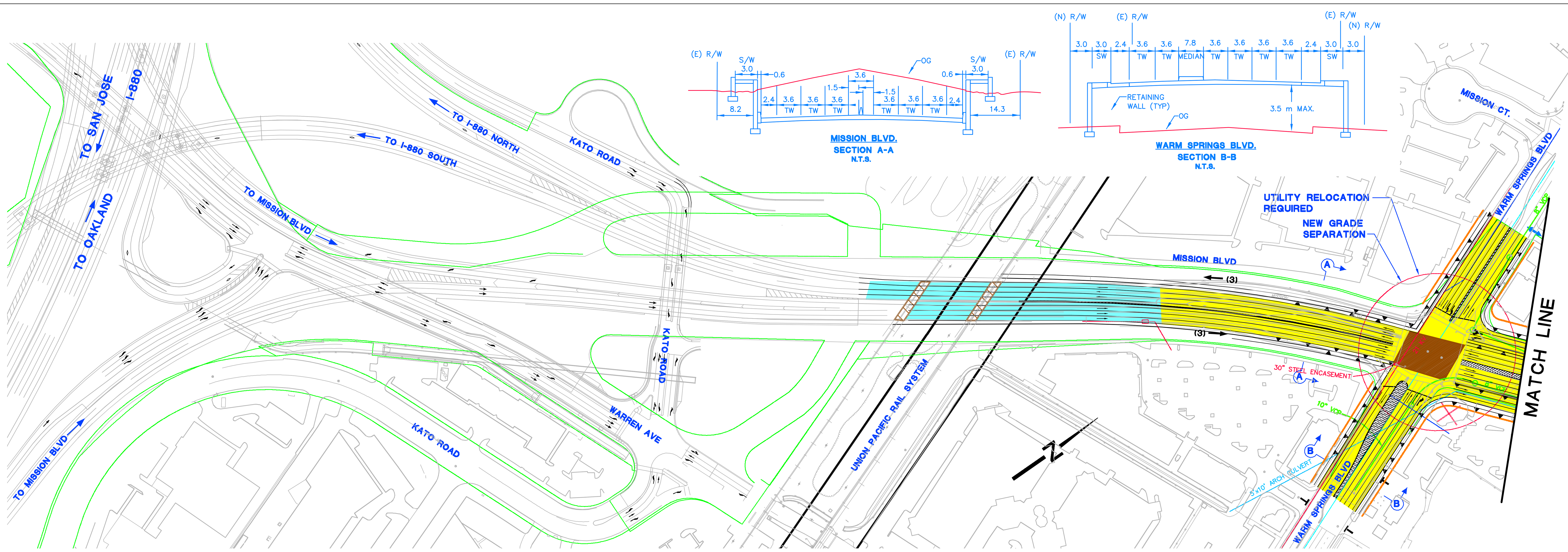

LEGEND

(E) PAVEMENT		(N) RIGHT OF WAY	
(E) ISLAND		(E) RIGHT OF WAY	
(E) STRUCTURE		(N) RETAINING WALL	
(N) PAVEMENT		DRIVEWAY	
(N) HOV LANE		BUILDING IMPACT LIKELY	
(N) RAMP		ELECTRICAL TOWER	
(N) STRUCTURE		ELECTRICAL	
DEMOLISH (E) STRUCTURE		GAS	
LOST DRIVEWAY ACCESS	⊢	SEWER	
TO BE REMOVED	X	STORM DRAIN	
		WATER	

Corridor C - Mission Blvd.
Mission/Warm Springs Grade Separation
I-680 Interchange Modification - C2(b1)

GRAPHIC SCALE
(IN METERS)
0 10 20 40 60 80 100
1 : 2000

Corridor C
Mission Blvd.
C2(b1)
SHEET 1 OF 2

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TJKM
Transportation Consultants

DRAFT TECHNICAL MEMORANDUM

March 29, 2004

To:	Chris Metzger, Nolte Inc.	**Project No.:**	142-039, Task 8
From:	Christopher Thnay, PE, AICP	**Jurisdiction:**	Santa Clara County
Subject:	Results of Additional Work (MOEs, Montague and Calaveras median HOV)		

This technical memorandum addresses several topics, including Measures of Effectiveness (MOE) that was selected for the Crossconnector Study, the potential effects of median HOV lanes on Calaveras Boulevard and Montague Boulevard.

I. Measures of Effectiveness

In the memorandum dated November 9, 2002, addressed to VTA staff, it stated that,

> *The performance measures in this memorandum should be viewed as those that will be used in some combination for prioritizing improvements from the various roadway corridor studies. This does not mean that the performance measures in this memorandum should be the only ones produced or used within each study. Each consultant should produce and use performance measures that are appropriate for the needs and goals of their specific study. In some instances, it may be appropriate to merely use the measures in this memorandum for the study.*

The following summarizes the performance measures and supporting information requested by the VTA for roadway corridor study improvements in Santa Clara County.

Core Measurements – Each of these should be provided for each distinct improvement that is to be prioritized against other improvements. A combination of these measures weighted in some manner will be used for countywide prioritization.

- Fatality Collision Rate - fatality, injury, and property damage only (PDO) collision rates;
- Person Hours of Travel (baseline and "with improvement")
- Travel Time Reliability (expected change in non-recurrent delay with improvement)
- Cost per PHT

Basic Supporting Measurements – Each of these should be provided for each distinct improvement that is to be prioritized. Some of the measurements are needed to calculate a core measurement.

- Traffic Volume (as needed for calculation of travel time reliability)
- Number of Lanes (as needed for calculation of travel time reliability)
- LOS E Capacity (as needed for calculation of travel time reliability)
- Average Mainline Speed (as available)
- Vehicle Hours of Travel (as basis of PHT)
- Vehicle Miles Traveled (to provide insight into PHT and as needed for calculation of travel time reliability)
- Average Vehicle Occupancy (as needed for calculation of PHT)
- Improvement Cost (total cost estimate of the improvement including breakdown of component costs)

The MOEs that were selected by the Technical Advisory Committee (TAC) utilizes all the above-mentioned VTA MOEs except the collision rates. Generally, the collision rate comparison is more appropriate when different alternatives are being considered for a particular corridor. However, for the crossconnector, six different corridors spread over almost eight miles are being considered. In this case, it is more critical to focus on the performance of all the other MOEs as compared to the other study corridors.

Specifically, the TAC committees adopted the following MOEs for the Crossconnector. The adopted MOE's are grouped under several categories: 1) descriptive, 2) performance, 3) derivatives and 4) economic.

1. Descriptive:

- ***Increase in through vehicle trips by corridor*** – Since one of the goals is to achieve capacity increases, so when there is a significant increase in vehicle trips in a corridor, it indicates an alternative that promotes new routes, with the best having the highest increase.

- ***Increase in HOV trips by corridor*** – This is a direct indication of the successful promotion of increased HOV use, with the best having the highest increase in carpools.

2. Performance:

- ***Increases in Vehicle Miles Traveled (VMT)*** and ***Speed in Mixed-Flow and HOV*** – The alternatives with the greatest increases in VMT and speeds are the best (both criteria should be met).

- ***Vehicle Hours of Travel (VHT) of Free Flow*** and ***VHT of Congested Flow*** – The alternatives with the lowest VHT of Congested Flow are best.

3. Derivative:

- ***% Change in VMT/ Change in VHT*** – When VMT goes up faster than VHT, this strongly indicates that more travelers are moving faster, even in the face of traffic growth. Such a circumstance

suggests that capacity has been successfully added to the study area (without impacting the north-south freeways). A 1.1 index is good and 1.2 is great.

4. Economic Analysis:

$/Person Trip – Again, the lowest values are the best. This is an expression of benefit/cost (b/c).

The set of MOEs were applied to approximately a dozen alternatives in the study. This results in the recommendation of four short-term alternatives.

II. Calaveras Boulevard (SR 237) Median HOV lanes

The purpose of this analysis is to evaluate any potential operational issues with the proposed HOV lane in the median. The scenario assumed that the HOV lane would be added to the median of SR 237. From the west, it assumes that the HOV lane will run in the median of SR 237 as it enters from near I-880 and continues through the City till it merges onto a HOV lane in the median and joins up with I-680.

There are several benefits and issues with the HOV lanes being located on the median. In the case of Calaveras Boulevard, as the HOV lane enters the City from the west, there is not enough distance for the HOV lane to transition out of the left-turn lane at the first intersection of Abbott Avenue. Consequently, it is anticipated that the eastbound to northbound left-turn lane would be located to the right of the HOV lane.

Special signing, striping, signal head and signal phasing would be required to safely facilitate the flow of traffic. In this case, the left-turn traffic would get its own left-turn phasing while the HOV and the through traffic in the mixed flow will move at the same time. It will appear unusual to the left-turn traffic to have the through traffic in the HOV lane to be located to its left side since all the through traffic are generally to the right of a left-turn pocket.

Moving towards the east, the left-turn pocket at Milpitas Boulevard and Hillview Avenue would be located to the left of the HOV lane. Under this scheme, the signal phasing at the intersections would be similar to the standard signal phasing.

III. Montague Expressway

The purpose of this qualitative analysis is to briefly analyze the feasibility of having an HOV lane on the inside lane of an eight lane facility.

Similar to the Calaveras Boulevard Median HOV alternative discussed above, special signing, striping, signal head and signal phasing would be required to safely facilitate the flow of traffic.

If the corridor design needs to accommodate the HOV lane on the median, to the left of a regular mixed-flow left-turn lane, it will appear unusual to the left-turn traffic to have the through traffic in the HOV lane to be located to its left side since all the through traffic are generally to the right of a left-turn pocket.

Left-turn traffic would get its own left-turn phasing while the HOV and the through traffic in the mixed flow will move at the same time. Overhead right-of-way arrows should be installed at appropriate locations.

Montague Expressway at I880 and I680

Based on the modeling data, TJKM evaluated several interchange reconfigurations that might improve the traffic operations. The 2025 model forecasting peak hour data is shown on Figure 1. TJKM created a micro-simulation based on the Synchro Sim Traffic software. The purpose of the micro-simulation model is to evaluate the effectiveness of any proposed alternatives.

As shown on Figure 1, both of the freeway ramps on Montague Expressway at I-680 and I-880 are cloverleaf ramps. The capacity of these lower speed loop on and off ramps are generally limited to no more than 800 to 900 vehicles per hour per lane (vphpl). Several of the loop ramps are forecasted to carry more than 1,200 vphpl.

Consequently, the operations at these ramps would fail. In addition, due to the weaving and merging of traffic at these loop-off and loop-on ramps within a short section on Montague Expressway underpass near both of the freeways, it is projected that major queuing would results from these conflicting traffic.